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EXAMINER	
AILES, BENJAMIN A	
ART UNIT	**PAPER NUMBER**
2142	

DATE MAILED: 12/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/935,440	BRUCKERT ET AL.	
	Examiner	Art Unit	
	Benjamin A. Ailes	2142	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 September 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13-29 and 31-42* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11, 13-29, 31-42* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the Amendment filed 28 September 2005.

2. Claims 1-11, 13-29, and 31-42 remain pending.

Claim Objections

3. The amendment to claim 3 has been entered into the record and overcomes the objection made in the prior office action. The objection to claim 3 regarding the use of "and/or" has been withdrawn.

Claim Rejections - 35 USC § 112

4. It is noted that the applicants have properly traversed the 112, first paragraph set forth in the prior office action in regards to claims 1-11, 13-29, and 31-42. The 112, first paragraph rejection has been withdrawn.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1, 22, 26, 28, 29, 31, 41, and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gervais et al. (U.S. 5,856,974), hereinafter referred to as Gervais, in view of Berman (U.S. 6,185,203).

8. Regarding claims 1, 22, 26, and 28, Gervais discloses a scalable clustered system, comprising:

a global fabric (fig. 1, element 102 – backbone); and

two or more cluster nodes interconnected via the global fabric (fig. 1., elements 104, 106, 108), each cluster node including a node naming agent (NNA) (fig. 1, elements 110, 112, 114), a local fabric and one or more end nodes interconnected via the local fabric (fig. 1, elements 132, 120, 116), the NNA being configured as a fully symmetrical translation device interposed between the local fabric and the global fabric (col. 4, lines 50-65), the NNA providing support for scaled clustering by transforming a local cluster address into a corresponding global cluster address for each packet in an outbound path from any of the cluster nodes and by transforming a global cluster address into a corresponding local cluster address for each packet in an inbound path to any of the cluster nodes (col. 4, lines 50-65), wherein intra-node cluster addressing is transparent to inter-node cluster address changes (col. 5, lines 55-65), and wherein re-configuration of the scalable clustered system requires no address re-assignments yet allowing the end nodes in the cluster nodes to maintain connectivity therebetween (col. 5, lines 55-65 and col. 6, lines 1-5).

Gervais discloses the system wherein the NNA performs the transformation of global/local cluster addresses (see abstract, lines 5-10 – it is understood that when a global address is translated into a local address, bit substitutions must take place), but does not explicitly disclose the utilization of a mask register in order for assisting in the transformation of global/local cluster addresses being made before an entire address has arrived at the NNA. However, Berman discloses an addressing method wherein a mask register is utilized (see col. 13, part. 3 Addressing Table, lines 15-36). Berman discloses the use of a mask register for incoming addresses in order to filter source and destination addresses as they arrive. One of ordinary skill in the art at the time of the applicant's invention to modify the invention of Gervais to utilize the use of a mask register in order to transform addresses as they arrive and before they arrive in their entirety because the use of mask registers are widely used in the computer networking field and are utilized mainly for their benefit of being able to control the retention or elimination of portions of the address.

Although the applicant teaches a clustered system operating with a fabric, the invention itself is regarding the node naming agent (NNA), which translates a network address, enabling a packet to be routed to its proper destination across a network. Thus, the invention merely substitutes a router with the NNA. By adding a level of indirection (referred to as "hierarchical" by the applicant) to the problem of address assignment in a clustered computing environment, the applicant or explicitly solves this problem. The invention will be treated as such from this point forward.

9. Claims 41 and 42 contain similar limitations and are rejected under the same rationale as claims 22 and 26.

10. Claims 29 and 31 contain similar limitations and are rejected under the same rationale as claim 1. In addition, regarding claim 29, Gervais discloses a super-clustered system comprising a cluster within a cluster (fig. 1, Domain 104 and 134, which is connected to backbone 102 by way of routers 110 and 114, where each router is performing address translation).

11. Claims 2-11, 13, 21, 23, 24, 27, 32, 34, 38-40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gervais.

12. Regarding claim 2, Gervais discloses the system wherein the local fabric and global fabric provide local and global clustering support infrastructures, respectively, and wherein global routing and global fabric topology are transparent to end nodes in operation (fig. 1 and col. 9, lines 30-33).

13. Regarding claim 3, Gervais discloses the system wherein the local and global fabric are each configured with one or more routers and/or switches (col. 6, lines 45-54).

14. Regarding claim 4, Gervais discloses the system wherein each of the end nodes is an addressable device representing a resource such as a microprocessor, a central processing unit (CPU), a memory, an input/output (I/O) device controller or a server (col. 1, lines 43-46).

15. Regarding claim 5, Gervais discloses the system, the re-configuration of which, by addition thereto or removal therefrom of any cluster node, is possible while maintaining the configuration of any of the other cluster nodes, and wherein

configuration of any of the cluster nodes is possible without reconfiguration of any of the other cluster nodes (col. 9, lines 30-39). By virtue of its transparency and by virtue of not requiring modification of the end nodes or the backbone, this feature is deemed inherent in Gervais.

16. Regarding claim 6, Gervais discloses the system wherein connections in the local and global fabric can be modified while maintaining correct packet transmission behavior (col. 9, lines 30-39). By virtue of its transparency and by virtue of not requiring modification of the end nodes or the backbone, this feature is deemed inherent in Gervais.

17. Regarding claim 7, Gervais discloses the system wherein the number of end nodes in each cluster node corresponds to an attribute of address fields in packets. (col. 4, lines 58-59 – "*The address mapping gateway substitutes the 'globally-unique' domain network address and a 'domain-unique' gateway mapped node address for a network number and node address...*" The term "node address" is defined as "node number" in col. 3, lines 12-13. Thus, it is understood that node address is also known as node number, which is stored somewhere in the address field).

18. Regarding claim 8, Gervais discloses the system wherein the NNA is configured to prevent a duplicated assignment of any end node address in establishing end node membership in a cluster node (col. 9, lines 60-65).

19. Regarding claim 9, Gervais discloses the system wherein the scalable clustered system has a hierarchical topology and wherein each of the cluster nodes has either a flat or a hierarchical topology (fig. 1 and fig. 3).

20. Regarding claim 10, Gervais discloses the system wherein local traffic of packets within any of the cluster nodes is not routed to its respective NNA. This feature is deemed inherent in Gervais due to the hierarchical layout of the routers. Packets meant for intra-domain (within a cluster) nodes will be routed by routers within the domain.

21. Regarding claim 11, Gervais discloses the system wherein global traffic of packets to and from each of the cluster nodes is routed via its respective NNA (col. 8, lines 21-38).

22. Regarding claim 13, Gervais discloses the system having hierarchical topology and address-identification scheme that relative to flat non-hierarchical topology require smaller address fields and routing tables (col. 9, lines 19-23).

23. Regarding claim 21, Gervais discloses the system wherein NNA includes data replacement registers programmable with information for converting local cluster address to global cluster address and global cluster address to local cluster address (col. 4, lines 50-65). The address translator as disclosed by Gervais is implemented using a computer and as such are inherently programmable.

24. Claim 23 is rejected under the same rationale as claim 1 for having similar limitations, except it also discloses establishing a cyclic redundancy check (CRC) value in an outbound packet CRC field based on whether a correct or incorrect CRC value is detected (col. 9, lines 14-19).

25. Claim 24 has similar limitations and is rejected under the same rationale as claim 23.

26. Regarding claim 27, Gervais discloses a computer readable medium wherein the computer program code is further configured to cause the NNA to prevent assignment of a same local address to two end nodes in the same cluster node, and associating an end node with more than one cluster node (col. 9, line 61 – col. 10, line 3).

27. Claim 38 has similar limitations and is rejected under the same rationale as claim 29.

28. Claims 32 and 34 have similar limitations and are rejected under the same rationale as claim 27.

29. Regarding claims 39 and 40, Gervais discloses the system wherein the local cluster address is a fixed (or local) cluster number of a cluster node (col. 4, lines 54-60 – the address mapping gateway replaces the globally-unique and domain-unique address for a network number and node address, respectively), and wherein the global cluster number assigned to the cluster node during cluster configuration (col. 7, lines 31-42 – explains the addressing scheme. The network number, or the global cluster ID, must have been assigned a number somehow during domain, or cluster, configuration).

30. Claims 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gervais in view of Berman, and further in view of Rowett et al. (U.S. 5,991,817), hereinafter referred to as Rowett.

31. Regarding claim 14, Gervais teaches a clustered system but does not explicitly disclose the NNA being a semiconductor chip. However, Rowett teaches the use of router being integrated onto a single silicon chip (see Abstract, line 1). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to

modify the invention of Gervais to include the address translation and routing device that is implemented onto a single silicon chip because it eliminates bulky hardware (Rowett, col. 1, lines 29-36).

32. Regarding claim 17, Gervais teaches a clustered system but does not explicitly disclose a device having a mode control register, the contents of which determine which mode of operation the NNA assumes. However, Rowett discloses a method and apparatus for a network router where certain components of the router have control enable bits, to which the router operates accordingly (col. 16, lines 19-21 and 26-30). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to provide control enable bits to control certain features of the device and to render it into various modes of operation for reasons of configurability and flexibility. There it would have been obvious to modify the invention of Gervais to include the teaching of Rowett for the explicit reasons discussed herein above.

33. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gervais in view Berman and Rowett and in further view of Leung (U.S. 6,636,498).

34. Regarding claim 15, Gervais teaches the system wherein the NNA has symmetrically built ends with one end being connected to the local fabric and the other end being connected to the global fabric but does not explicitly teach the each end includes status indications and control enable bits. However, Rowett teaches a method and apparatus for a network router where certain components of the router have control enable bits, to which the router operates accordingly (col. 16, lines 19-21 and 26-30). Leung teaches a mobile IP mobile router that includes a status indicator indicating that

the network is active (col. 12, lines 50-58). It would have been obvious to one of ordinary skill in the art the time of the applicant's invention to provide control enable bits to control certain features of the device. It would have also been obvious to provide status indications to clearly display and communicate router status. In addition to clearly conveying the status (of the mode in which the router is operating, for example), status indication is important for purposes of diagnosis during a problem. Therefor, it would have been obvious to one of ordinary skill in the art to modify the invention of Gervais to include these feature for the explicit reasons discussed herein above.

35. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gervais in view of Berman and Rowett and Leung and in further view of Matsuzawa (U.S. 6,389,023).

36. Regarding claim 16, Gervais teaches the scalable clustered system, but does not explicitly disclose the control enable bits, in which the said control enable bits include a shutdown on missing clock enable, a replace source address enable, a replace destination address enable, a destination address checking enable and a pass-through enable. As discussed in claim 15, the modification of Gervais to include control enable bits discussed in Rowett teaches control enable bits to control certain features of the device. Matsuzawa discloses a router apparatus where it checks the destination MAC address (col. 14, lines 5-7). Gervais discloses a network address translation device that replaces source and destination address (col. 7, lines 55-56). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to include source and destination address replacement and destination address checking

mode to the modified invention as discussed in claim 15, as various options and different modes of operation endow the device with customizability. Therefore, it would have been obvious to one of ordinary skill in the art to modify the combination of Gervais, Rowett, and Leung to include these feature for the explicit reasons discussed herein above.

37. Claims 18 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gervais in view of Berman and Rowett and further in view of Tsukakoshi et al. (U.S. 6,577,634), hereinafter referred to as Tsukakoshi, and Civanlar et al. (U.S. 6,078,963), hereinafter referred to as Civanlar.

38. Regarding claim 18, the combined teaching of Gervais and Rowett teaches the scalable clustered system as in claim 17, but does not explicitly teach the NNA's mode of operation include a pass-through mode, a conversion mode, and an error check mode but fails to include an error recovery mode and a shutdown mode. However, Tsukakoshi teaches a highly expandable router configuration technology where the routers may go into shutdown mode by automatically powering itself off (col. 5, lines 14-20). Civanlar teaches a network router having a plurality of intelligent router ports where functions include data error detection, and/or data error recovery (col. 7, lines 52-54). Rowett teaches a method and apparatus for a network router where certain components of the router have control enable bits, to which the router operates accordingly (col. 16, lines 19-21 and 26-30). And conversion mode is the default mode in which Gervais' device operates. It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to combine the teaching of Gervais with

the teaching of Rowett to enable the device to have various modes of operation. It would have been obvious to one of ordinary skill in the art to further modify the combined teaching of Gervais and Rowett to include shutdown mode taught by Tsukakoshi and error detection and recovery mode are important features of an address translation device where fault-tolerance and high availability are paramount to its functionality. The ability to shut down when problems arise (when error has been detected and there is no way to recover from the problem, for example) goes in tandem with error detection and recovery. Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Gervais and Rowett with the teaching of Tsukakoshi and Civanlar for the explicit reasons discussed herein above.

39. Regarding claim 20, the combined teaching of Gervais, Rowett, Tsukakoshi, and Civanlar teaches the scalable clustered system as in claim 18, but does not teach that the default mode of the NNA upon initialization is the pass-through mode. In pass-through mode, all the features of the device are disabled, where packets are sent to the ports unchanged. This is essentially how a hub operates, which indiscriminately forwards packets in unmodified form to all ports. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the combined invention of Gervais, Rowett, Tsukakoshi, and Civanlar to include the pass-through mode as the default mode of initialization because the device must first discover information about the computers in the network or cluster in order to start address translation.

40. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gervais in view of Berman, Rowett, and Matsuzawa.

41. Regarding claim 19, the combined teachings of Gervais, Berman, Rowett, and Matsuzawa teaches the scalable clustered system as in claim 1, but fails to teach that, while in conversion mode, the NNA is configured to perform source and destination clustered identification (ID) translation and destination address checking. Gervais' normal mode of operation performs destination address translation. It would have been obvious to include the control enable bits of Rowett to put it into various modes of operation. And it would have been obvious to include Matsuzawa's destination address checking to the invention of Gervais to minimize errors and to ensure that the packets are delivered to their proper destination. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the combination of Gervais, Berman, and Rowett to include the feature taught by Matsuzawa for the explicit reasons discussed herein above.

42. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gervais in view of Bommareddy et al. (U.S. 6,779,039), hereinafter referred to as Bommareddy.

43. Regarding claim 25, Gervais discloses the method as in claim 24, but does not disclose of verifying proper routing by checking a destination cluster ID field in an inbound packet. However, Bommareddy discloses a router clustering system where the destination IP address is checked to determine whether the destination IP address is a cluster address (col. 8, lines 35-38). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the combination of Gervais to

include the feature taught by Bommareddy because destination address checking minimizes errors and ensures that the packets are delivered to their proper destination cluster.

44. Claims 33, 35, 36, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gervais in view of what was well-known in the art at the time the invention was made.

45. Regarding claims 33, 35, 36, and 37, Gervais discloses a scalable clustered system operating in an IPX network. However, TCP/IP is ubiquitous and well known in the art. It is the de facto standard for transmitting data over the networks. Therefore, it would have been obvious to one of ordinary skill in the art at the time the applicant's invention to modify the invention of Gervais to enable it to operate in a TCP/IP network because TCP/IP is the de facto standard for transmitting data over the networks.

Response to Arguments

46. Applicant's arguments filed 28 September 2005 have been fully considered but they are not persuasive. Applicant argues mainly for independent claims 1, 22, 26, 28, and 29 that Bermain does not disclose "transforming a cluster address in which bit substitutions can be made before an entire address has arrived." The Examiner respectfully disagrees. The Examiner has relied upon the base reference of the patent to Gervais teaching the system wherein the NNA performs the transformation of global/local cluster address (see above in rejection of claim 1) and for the method of a mask register in order for assisting in the transformation of global/local cluster addresses being made before an entire address has arrived at the NNA.as being taught

by the patent to Berman. In response to the argument presented by the applicant, it is stressed by the Examiner that Berman discloses the ability to perform methods on portions of addresses by utilizing any number of bits in an address (some or all). This main fact of being able to utilize any portion of the address implies that an address can be transformed before the entire address has arrived because smaller portions of the address can be manipulated. In conclusion, the Examiner maintains that Berman, in combination with Gervais as explained in full in the rejection of claim 1, does in fact disclose "transforming a cluster address in which bit substitutions can be made before an entire address has arrived," as claimed by applicant.

Conclusion

47. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Benjamin A. Ailes whose telephone number is (571)272-3899. The examiner can normally be reached on M-F 6:30-4, IFP Work Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Caldwell can be reached on (571)272-3868. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

baa

Beatriz Prieto
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PRIMARY EXAMINER